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CALONECTRIA LEAF SPOT OF FORSTER SENTRY PALM

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Introduction

Howea forsterana is commonly known as sentry palm, Forster sentry palm, or kentia palm. It is native to Lord Howe Island, southeast of Sydney, Australia, and was erroneously thought to be related to the genus *Kentia*, found on the Australian continent. The use of kentia palm as a common name for *Howea* has persisted and can be a source of confusion. Sentry palm, thatch-leaf palm, or preferably Forster sentry palm would be a more appropriate name to distinguish it from the Belmore sentry palm, another *Howea* species also referred to as sentry palm.

Palms originally identified as *Kentia* species are now placed within *Howea*, *Hedyscepe*, *Ptychosperma*, *Lepidorrachis*, and *Gronophyllum*.

Forster sentry palm is a slow-growing, solitary feather palm that reaches heights of 60 ft (18 m) or more. As an indoor foliage plant, it is very durable and elegant. It was used as a potted plant as long ago as the 1800s, and today it is enjoying a tremendous burst of popularity. *Howea forsterana* is one of the four major palms produced by Hawaii's export foliage industry.

Disease and Symptoms

An outbreak of leaf spots characterized by grayish-brown, dark brown, or nearly black spots to blights recently occurred on Forster sentry palm in nursery production. Young spots were brown, 1/64" (0.5 mm) in diameter, and were surrounded by a chlorotic band approximately 1/32" (1 mm) wide. Older spots were dark brown to black, irregular in shape but approximately circular to elliptical, measuring as large as 1/8" × 3/16" (3 × 5 mm), with grayish-brown centers. These spots expanded, coalesced, and lost definition as leaflet margins and tips became necrotic (Figs. 1, 2, and 3) and the frond turned chlorotic.

Brown to black circular spots 1/32" (1 mm) in diameter or larger, and elliptical spots up to 1/8" × 3/8" (3 × 10 mm), also occurred on petioles (Fig. 4). Some of the smaller petiole spots appeared spindle shaped, due to linear streaks extending longitudinally 1/32" (1 mm) in each direction from the necrotic centers.

Cause and Spread

Three related fungal species, *Calonectria theae*, *C. colhounii*, and *C. crotalariae*, were isolated from diseased leaves collected from commercial nurseries. In controlled experiments, all three *Calonectria* species were shown to be pathogenic to sentry palm leaves. Young, partially expanded leaves were very susceptible, while fully expanded, dark-green mature leaves were more tolerant to infection (Figs. 5 and 6). *Chrysalidocarpus lutescens* (areca palm), *Chamaedorea elegans* (parlor palm), and *Laccospadix* sp. were all moderately susceptible to *Calonectria theae* and *C. colhounii*.

High humidity and free moisture were major factors favoring *Calonectria* infection and disease development. Unprotected young leaves, inoculated with spores of *C. theae* and maintained in a glass greenhouse with low relative humidity, did not become infected. However, inoculated *Howea* plants developed lesions within a week when placed either adjacent to or under a mist system of five seconds of mist every two minutes.

All three species of *Calonectria* produce two major types of spores: asexual conidia and sexual ascospores. Conidia are log-shaped (cylindrical) vegetative spores (Fig. 7) and are formed in abundance on diseased plant parts. Conidial production is rapid, and large quantities of spores can be produced in a 24-hour period. Ascospores are formed within asci or sacs contained within spherical fruiting bodies, called perithecia (Fig. 8). The perithecia are very small, but can be seen with the unaided eye as red-brown (*C. theae* and *C. crotalariae*) or yellow to brown (*C. colhounii*) bodies. Under the microscope, perithecia are reddish-orange (*C. theae* and *C. crotalariae*) or yellow (*C. colhounii*), and become brown with age. Perithecia are not formed as rapidly as conidia. Typically, there are fewer ascospores than conidia. In pure culture, perithecia with mature ascospores are produced within 15 days after colonies are established, while conidia are produced in two to three days.

Conidia are dispersed primarily by moving diseased plants, splashing water, or using contaminated pots, equipment, and potting

Figure 1. Leaf spots of *Howea forsterana* (Forster sentry palm) caused by *Calonectria theae*.

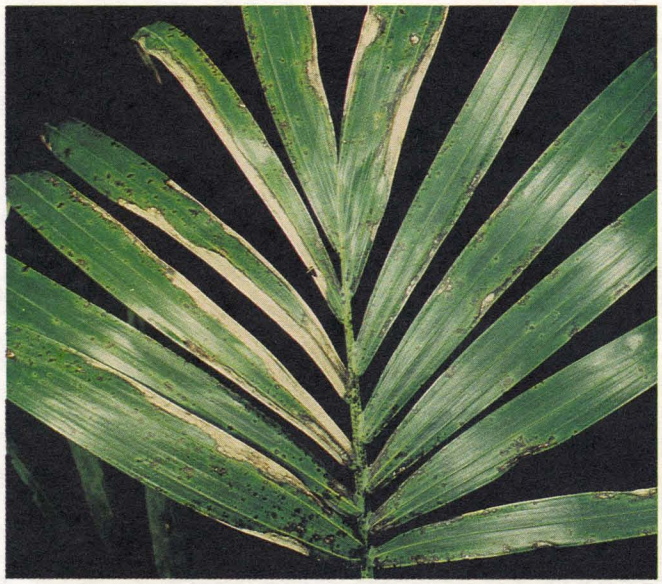

Figure 2. Close-up of leaf blight caused by *Calonectria theae*.

Figure 3. Close-up of expanding leaf spots with gray centers.

Figure 4. Petiole spots of *Howea forsterana* caused by *Calonectria theae*.

Figure 5. Howea leaf inoculated with spores of *Calonectria crotalariae*, one month after inoculation. Right half of leaf inoculated; left half received water only.

Figure 6. Howea leaf inoculated with spores of *Calonectria colhounii*.

Figure 7. Photomicrograph of *Calonectria theae* conidia (asexual spores). Magnification = 420X.

Figure 8. Photomicrograph of *Calonectria theae*. Perithecium discharging ascospores (sexual spores). Magnification = 100X.

media. Ascospores are forcibly discharged from perithecia, caught in air currents, and blown about the nursery. Thus, the radius of natural disease spread by ascospores is many times greater than conidial spread, making it urgent that diseased tissue be removed and destroyed before ascospores mature and spread.

Control

All badly diseased and dead leaves should be removed and destroyed. One or two applications of benomyl (Benlate) at 1/2 lb per 100 gal, with occasional applications thereafter, should provide excellent supplemental control of the disease. Frequent applications of this fungicide have resulted in selection of resistant strains of many other fungi, so precautions should be taken against excessive use. Mancozeb (Dithane M-45) at 2 lb per 100 gal is also effective against these fungi.

Any practice that reduces free moisture on leaves or the relative humidity in the growing environment will discourage disease development. Moisture favors disease development because it is required for sporulation, growth, infection, and spread of the pathogen.

Other Hosts of Calonectria

This is the first observation of *C. colhounii* as a pathogen in Hawaii. Elsewhere, it has been reported on leaves of tea and eucalyptus. *Calonectria theae* has been found to cause foliar diseases on ohia (*Metrosideros collinus*) and koa (*Acacia koa*) in Hawaii. From other parts of the world, it has been reported on tea, azalea, and eucalyptus. *Calonectria crotalariae* has been commonly encountered on ornamental plants. Diseases of grape ivy (*Cissus rhombifolia*), leea (*Leea coccinea*), anthurium (*Anthurium andraeanum*), and orchids have been associated with *C. crotalariae*. This fungus also causes a severe field disease of alfalfa seedlings and papaya plants.

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